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EXAMINER	
QUASH, ANTHONY G	
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Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary	Application No.	Applicant(s)	
	09/787,358	MARRIOTT, PHILIP	
	Examiner	Art Unit	
	Anthony Quash	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/30/04 (RCE)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/4;10/4;11/4;12/4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 28-35,50-52,54 are rejected under 35 U.S.C. 102(e) as being anticipated by Eiden [6,259,091]. With respect to claims 28,50, Eiden [6,259,091] discloses a mass spectrometer and method of operating a mass spectrometer comprising an ion source for generating an ion beam from a sample introduced into a plasma, the beam containing unwanted gas components, the collision cell within an evacuation chamber, the collision cell being disposed to receive at least a portion of the ion beam from the ion source and arranged to be pressurized with a target gas for removing unwanted ions from the ion beam in the collision cell, an ion optical device configured upstream of the collision cell to reduce gas loading from the ion source on the collision cell, and a mass-to-charge ratio analyzer disposed within an analyzing chamber and arranged to receive at least a portion of the ion beam from the collision cell and to mass analyze the received ion beam to produce a mass spectrum of the received ion beam. See Eiden [6,259,091] abstract, figs. 1,3-4,7,9, columns 1-2, col. 3 lines 5-15,30-35,45-60, col. 4 line 10-65, col. 5 lines 15-35, col. 6 lines 20-28, 44-60, col. 7 lines 30-45, col. 8 lines 24-67, columns 9-12, column 15, col. 16 lines 60-67, col. 17 lines 1-40, col. 18 lines 10-35.

As per claim 29,51, Eiden [6,259,091] discloses reducing gas loading comprising passing the ion beam through a transmission-enhancing device, such as ion optics (720). See Eiden [6,259,091] figs. 1,3-4,7,9, column 15, col. 16 lines 60-67, col. 17 lines 1-40, col. 18 lines 10-35.

As per claim 30, Eiden [6,259,091] discloses the ion optical device comprising a quadrupole, multipole, ion guide, ion lens or sector (720,750). See Eiden [6,259,091] figs. 1,3-4,7,9, column 15, col. 16 lines 60-67, col. 17 lines 1-40, col. 18 lines 10-35.

As per claim 31, Eiden [6,259,091] discloses the ion optical device comprising a magnet sector. See Eiden [6,259,091] col. 17 lines 30-40, col. 18 lines 25-35.

As per claim 32, Eiden [6,259,091] discloses the ion optical device being mass selective. See Eiden [6,259,091] fig. 3, col. 8 lines 40-65.

As per claims 33,54 Eiden [6,259,091] discloses a sampling aperture (20) configured for transmitting some of the ions from the ion source into an evacuated expansion chamber (15,25) upstream of the ion optical device. See Eiden [6,259,091] figs. 1,3-4,7,9, col. 8 lines 25-67.

As per claim 34, Eiden [6,259,091] discloses an aperture for transmitting some of the ion beam from the expansion chamber into the evacuation chamber. See Eiden [6,259,091] figs. 1,3-4,7,9, col. 8 lines 25-67.

As per claims 35,52 Eiden [6,259,091] discloses the ions from the ion beam being transmitted through the ion optical device along an axis. See Eiden [6,259,091] abstract, figs. 1,3-4,7,9, columns 1-2, col. 3 lines 5-15,30-35,45-60, col. 4 line 10-65,

col. 5 lines 15-35, col. 6 lines 20-28, 44-60, col. 7 lines 30-45, col. 8 lines 24-67, columns 9-12, column 15, col. 16 lines 60-67, col. 17 lines 1-40, col. 18 lines 10-35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5,13-20,36,44-49,53,55-56,613 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eiden [091] in view of Whitehouse [6,753,523]. As per claim 1, Eiden [091] teaches a mass spectrometer comprising; means for generating ions (900) from a sample introduced into a plasma, a sampling aperture (20) for transmitting some of the ions into an evacuated expansion chamber (15) along a first axis to form an ion beam; a second aperture (3) for transmitting some of the ion beam into a first evacuated chamber, a first pump for maintaining the first evacuated chamber at high vacuum, a first ion optical device being located in the first evacuated chamber (15) for containing the ion beam wherein the first ion optical device is a mass selective device, a third aperture (40) for transmitting the ion beam into a second evacuated chamber (25) at a lower pressure than the first evacuated chamber (15); a collision cell (710) having an entrance aperture (740) and an exit aperture (770) and pressurized with a target gas, the collision cell (710) being disposed in the second evacuated chamber (25); a second ion optical device (720) located in the collision cell for containing the ion beam; and

fourth aperture for transmitting the ion beam into a third evacuated chamber (35) containing mass-to-charge ratio analyzing means (10) disposed along an axis for mass analyzing the ion beam to produce a mass spectrum of the ion beam. In addition, Eiden [091] teaches a third pump for maintaining the third evacuated chamber at lower pressure than the second evacuated chamber. See Eiden [091] abstract, figs. 1,3-4,7, col. 4 lines 1-20 and 34-40, col. 8 lines 24-67, col. 9 lines 1-40, col. 10 lines 25-41, col. 12 lines 25-40, col. 15 lines 15-40. However, Eiden [091] does not specifically state that the mass-to-charge ratio analyzing means operate at the same mass to charge ratio. Whitehouse [6,753,523] teaches that multiple line segments of multiple ion guides/multipoles being operated independently of one another. In addition, it teaches that it multiple ion guides/multipoles being used in m/z (m=mass, z=charge) selection in order to narrow the range of m/z values entering the TOF pulsing region in order to obtain a spectrum of only those ions of interest. Also see Whitehouse [6,753,523] abstract, **figs. 1-7,10-17,20**, col. 7 lines 35-67, column 8, col. 9 lines 5-10,50-60, col. 10 lines 20-40,55-60, col. 11 lines 1-6,35-45,60-57, col. 14 lines 15-25,30-45, col. 15 lines 30-35,45-65, **col. 16, lines 1-20,30-67,** col. 17, lines 30-45,60-67, col. 18 lines 10-25, col. 19 lines 50-68, col. 20 lines 5-42, **col. 21 lines 44-67, col. 22 lines 1-20, 35-60, col. 23 lines 3-10, 25-67,** col. 24 lines 5-10,20-40, column 25, **col. 26 lines 5-40,** col. 27 line 65 – col. 28 line 25, 40-45, **col. 38 line 60 – column 40,** col. 44 lines 5-25. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the mass-to-charge ratio analyzing means operate at the same mass to charge ratio in order to narrow the range of m/z values entering the

TOF pulsing region in order to obtain a spectrum of only those ions of interest as taught by Whitehouse [6,753,523].

As per claim 2, Eiden [091] teaches all aspects of the claim except for the first evacuated chamber being maintained at a pressure of approximately 10^{-2} to 10^{-4} mbar. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first evacuated chamber be maintained at a pressure of approximately 10^{-2} to 10^{-4} mbar, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claims 3, Eiden [091] teaches all aspects of the claim except for the first evacuated chamber being maintained at a pressure of approximately 1-2 x 10^{-3} mbar. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first evacuated chamber be maintained at a pressure of approximately 1-2 x 10^{-4} mbar, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

As per claims 4, Eiden [091] teaches the ion beam, resulting from transmitting some of the ions from the ion source through a sampling aperture (20) into an evacuated expansion chamber (15) along a first axis, being transmitted into the first evacuated chamber through a second aperture, and into the second evacuated chamber (25) through a third aperture, and wherein a gap is maintained between the third aperture and an entrance aperture of the collision cell (710). See Eiden [091] figs. 1,3-4, and 7. However, it does not specifically state that the gap be at least 2 cm. It

would have been obvious to one of ordinary skill in the art at the time the invention was made to have the gap be at least 2 cm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claim 5, Eiden [091] teaches a distance being maintained between the ion source and an entrance aperture of the collision cell. See Eiden [091] fig. 7 and col. 8 lines 25-67 and col. 9 lines 1-40. However, it does not specifically state that the distance maintained should be 90 to 200 mm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a distance of 90 to 200 mm be maintained between the ion source and an entrance aperture of the collision cell, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claim 13, Eiden [091] teaches a method of operating an mass spectrometer that incorporates a collision cell pressurized with a target gas, the method comprising; generating, from an ion source, an ion beam including analyte ions and artifact ions, mass selecting at least a portion of the ion beam at an analyte mass to charge ratio, transmitting at least a portion of the mass selected ion beam into the collision cell. See Eiden [091] col. 8 lines 25-67 and col. 9 lines 1-40. Although Eiden [091] does not specifically state that mass analyzing the beam at the analyte mass to charge ratio, it would have been obvious to one of ordinary skill in the art at the time the invention was made to analyze the beam at the analyte mass to charge ratio in order to

see a spectrum of the ions of interest. Also see Whitehouse [6,753,523] abstract, figs. 1-7,10-17,20, col. 7 lines 35-67, column 8, col. 9 lines 5-10,50-60, col. 10 lines 20-40,55-60, col. 11 lines 1-6,35-45,60-57, col. 14 lines 15-25,30-45, col. 15 lines 30-35,45-65, col. 16, lines 1-20,30-67, col. 17, lines 30-45,60-67, col. 18 lines 10-25, col. 19 lines 50-68, col. 20 lines 5-42, col. 21 lines 44-67, col. 22 lines 1-20, 35-60, col. 23 lines 3-10, 25-67, col. 24 lines 5-10,20-40, column 25, col. 26 lines 5-40, col. 27 line 65 – col. 28 line 25, 40-45, col. 38 line 60 – column 40, col. 44 lines 5-25.

As per claim 14, Eiden [091] teaches the mass selecting being achieved by passing the ion beam through a first mass selective ion optical device (60,750). See Eiden [091] figs. 1,3-4, 7, col. 8 lines 25-67 and col. 9 lines 1-40.

As per claim 15, Eiden [091] teaches all aspects of the claim except for stating that the first mass selective ion optical device being located in a first evacuated chamber maintained at a high vacuum. It does however; teach the first vacuum chamber being maintained at a high vacuum. See Eiden [091] figs. 1,3-4, 7, col. 8 lines 1-40 and col. 10 lines 25-45. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to locate the first mass selective ion optical device in a first evacuated chamber in order to increase the amount of analyte ions entering the collision cell by rejecting the artifact ions in the beam.

As per claim 16, Eiden [091] teaches the collision cell being located in a second evacuation chamber operated at lower pressure than the first evacuated chamber and the ion beam being contained in the second evacuated chamber by a second ion optical device. See Eiden [091] figs. 1,3-4, 7, col. 9 lines 1-40 and col. 10 lines 25-45.

As per claim 17, Eiden [091] teaches all aspects of the claim except for the first evacuated chamber being maintained at a pressure of approximately 10^{-2} to 10^{-4} mbar. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first evacuated chamber be maintained at a pressure of approximately 10^{-2} to 10^{-4} mbar, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claim 18, Eiden [091] teaches all aspects of the claim except for the first evacuated chamber being maintained at a pressure of approximately 1-2 x 10^{-3} mbar. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first evacuated chamber be maintained at a pressure of approximately 1-2 x 10^{-4} mbar, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

As per claim 19, Eiden [091] teaches transmitting at least a portion of the ion beam, from the ion source through a sampling aperture (20) into an evacuated expansion chamber (15) along a first axis, into the first evacuated chamber through a second aperture, wherein transmitting at least a portion of the mass selected ion beam into the collision cell includes transmitting at least a portion of the ion beam into the second evacuated chamber (25) through a third aperture, and wherein a gap is maintained between the third aperture and an entrance aperture of the collision cell (710). See Eiden [091] figs. 1,3-4, and 7. However, it does not specifically state that the gap be at least 2 cm. It would have been obvious to one of ordinary skill in the art

at the time the invention was made to have the gap be at least 2 cm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claim 20, Eiden [091] teaches a distance being maintained between the ion source and an entrance aperture of the collision cell. See Eiden [091] fig. 7 and col. 8 lines 25-67 and col. 9 lines 1-40. However, it does not specifically state that the distance maintained should be 90 to 200 cm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a distance of 90 to 200 cm be maintained between the ion source and an entrance aperture of the collision cell, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

As per claim 36,53,61, Eiden [6,259,091] teaches all aspects of the claim except for explicitly stating the neutral gas of the unwanted components diverging from the axis at the ion optical device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the neutral gas of the unwanted components diverge from the axis at the ion optical device, in order to prevent the unwanted components from entering the collision cell, and thereby creating daughter ions of unwanted m/z ratios.

As per claim 44, Whitehouse [6,753,523] teaches that it was known to use ion guides as mass filters. See Whitehouse [6,753,523] column 40, col. 44 lines 5-20. Therefore it would have been obvious to one of ordinary skill in the art at the time the

invention was made to have the ion beam pass along a path and the neutral gas of the unwanted gas components diverge from the path, since it is well known for m/z filters to deflect ions not in the selected range, while allowing ions in the selected range to proceed along the path.

As per claims 45-46, Eiden [6,259,091] teaches the ion optical device being configured such that the at least a portion of the ion beam received by the collision cell is substantially free of neutral gas components from the ion source, and an ion optical device being configured for containing the ion beam as it passes through the collision cell. See Eiden [6,259,091] abstract, figs. 1,3-4,7,9, columns 1-2, col. 3 lines 5-15,30-35,45-60, col. 4 line 10-65, col. 5 lines 15-35, col. 6 lines 20-28, 44-60, col. 7 lines 30-45, col. 8 lines 24-67, columns 9-12, column 15, col. 16 lines 60-67, col. 17 lines 1-40, col. 18 lines 10-35.

As per claims 47-49,55-56 Whitehouse [6,753,523] teaches a first pump for maintaining the evacuation chamber at a first pressure and a second pump for maintaining the analyzing chamber at a second vacuum pressure. It also teaches a first pump for maintaining the intermediate evacuation chamber at a first vacuum pressure, and a second pump for maintaining the evacuation chamber at a second vacuum pressure lower than the first vacuum pressure. Whitehouse [6,753,523] also teaches the collision cell being located within an evacuation chamber, the mass-to-charge ratio analyzer being located within an analyzer chamber, and the method including evacuating the evacuation chamber to a first vacuum pressure, evacuating the analyzer chamber to a second vacuum pressure that is lower than the first pressure.

See Whitehouse [6,753,523] abstract, figs. 1-7,10-17,20, col. 7 lines 35-67, column 8, col. 9 lines 5-10,50-60, col. 10 lines 20-40,55-60, col. 11 lines 1-6,35-45,60-57, col. 14 lines 15-25,30-45, col. 15 lines 30-35,45-65, col. 16, lines 1-20,30-67, col. 17, lines 30-45,60-67, col. 18 lines 10-25, col. 19 lines 50-68, col. 20 lines 5-42, col. 21 lines 44-67, col. 22 lines 1-20, 35-60, col. 23 lines 3-10, 25-67, col. 24 lines 5-10,20-40, column 25, col. 26 lines 5-40, col. 27 line 65 – col. 28 line 25, 40-45, col. 38 line 60 – column 40, col. 44 lines 5-25.

Claims 6,8-11,21-24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eiden [091] in view of Whitehouse [6,753,523] and further in view of Tanner [638]. As per claim 6, Eiden [091] teaches a method and apparatus comprising locating a mass-to-charge ratio analyzing means (10) in a third evacuated chamber (35) and being operated at lower pressure than the second evacuated chamber (25). See Eiden [091] fig. 7, col. 9 lines 1-40 and col. 10 lines 25-40. However, Eiden [091] does not specifically state the mass-to-charge ratio analyzing means being disposed along a second axis wherein the mass-to-charge ratio analyzing means includes a main filter, which preferably is an RF quadrupole. Tanner [638] does teach the mass-to-charge ratio analyzing means (66) includes a main filter (64), which preferably is an RF quadrupole. See Tanner [638] abstract, fig. 1, and col. 3 lines 55-67 and col. 4 lines 1-40. Also see Whitehouse [6,753,523] figs. 1-7, 13, col. 7 line 60 - col. 8 line 10, 20-40, col. 11 lines 35-42, col. 16 lines 10-20,30-68, col. 17 lines 60-67, col. 22 lines 1-15,39-60, col. 23 lines 1-10,25-68, col. 24 lines 20-40, col. 40 lines 35-65. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was

made to have the mass-to-charge ration analyzing means include a main filter which preferably is an RF quadrupole in order to further filter out artifact ions coming out of the collision cell in order to obtain a better spectrum of analyte ions. In addition it would have been obvious to use an RF quadrupole to aid in the filtering since it was know in the art that RF quadrupoles are used for filtering and guiding ions. With regards to the mass-to-charge ratio analyzing means being located along a second axis, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the mass-to-charge ratio analyzing means be located along a second axis, since it has been held that rearranging parts of an invention involves only routine skill in the art.

As per claim 21, Eiden [091] teaches all aspects of the claim except for specifically stating that the mass analyzer be located in a third evacuated chamber operated at lower pressure than the second evacuated chamber, the mass analyzer being disposed along a second axis. Eiden [091] does however teach the mass analyzer (210) being located in a fourth evacuated chamber at about the same pressure as the third evacuated chamber, which is at a pressure which is less than the second evacuated chamber. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the mass analyzer be located in the third evacuated chamber at a pressure which is less than that of the second evacuated chamber since the examiner takes official notice of the equivalence of placing the mass analyzer in the third chamber to placing the mass analyzer in the fourth chamber since both chambers are at about the same pressure, for their use in the art of ion transfer

due to pressure change and the selection of any of these known equivalents to transferring ions due to differences in pressure would be within the level of ordinary skill in the art. See Eiden [091] figs. 1,4,7 col. 9 lines 15-40, col. 10 lines 25-45, col. 12 lines 25-48. With respect to the applicant's claim about the mass analyzer being located along a second axis, the examiner would like to state that it is unclear from the claim exactly where this second axis is located and in which direction the axis faces. Therefore, it is the examiner's view that the mass analyzer is located along a second axis.

As per claims 8 and 22, Eiden [091] teaches the first mass selective ion optical device being an RF quadrupole. See Eiden [091] col. 8 lines 55-67.

As per claims 9 and 23, Eiden [091] teaches the second ion optical device being an RF quadrupole. See Eiden [091] fig. 7 and col. 15 lines 35-40.

As per claims 10 and 24, Eiden [091] teaches the second ion optical device being mass selective. See Eiden [091] col. 17 lines 10-25.

As per claims 11 and 26, Eiden [091] teaches all aspect of the claim except for the second axis being offset from the first axis. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second axis being offset from the first axis, since it has been held that rearranging parts of an invention involves only routine skill in the art.

Claims 12 and 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eiden [091] in view of Whitehouse [6,753,523] and further in view of Okamoto [739]. Eiden [091] teaches all aspects of the claim except for specifically stating that the first

evacuated chamber is divided into a first region adjacent to the expansion chamber containing an extractor lens driven at a negative potential, and a second region adjacent to the collision cell, by a larger diameter aperture and the aperture being sealable by means of a flat plate on an O-ring seal. Okamoto [739] teaches the first evacuated chamber being divided into a first region adjacent to the expansion chamber containing an extractor lens (90) driven by a negative potential and a second region adjacent to the collision cell by a large diameter aperture and the aperture being sealable. See Okamoto [739] fig. 3 and col. 3 lines 10-30 and 45-65. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use have the first evacuated chamber being divided into a first region adjacent to the expansion chamber containing an extractor lens (90) driven by a negative potential and a second region adjacent to the collision cell by a large diameter aperture and the aperture being sealable in order to extract ion from the ion source and keep artifacts from entering the collision cell. With regard to the applicants' claim that the aperture is sealable by means of a flat plate on an O-ring seal, it is well known that O-rings are used to aid in the creating air/fluid type seals. In addition, it is obvious that a flat plate placed adjacent a hole that has a circular and planar configuration would seal a hole in a vacuum chamber due to the vacuum.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eiden [091] in view of Whitehouse [6,753,523]. As per claim 27, Eiden [091] teaches a mass spectrometer comprising an ion source for generating an ion beam from a sample introduced into a plasma, an ion optical device (750) disposed to receive at least a

portion of an ion beam generated by the ion source, the ion optical device (750) being configured to mass select at least a portion of the ion beam generated by the ion source at a mass-to-charge ratio, a collision cell (710) disposed to receive at least a portion of a mass selected ion beam from the ion optical device (750), and a mass analyzer (10) disposed to receive at least a portion of the mass selected ion beam from the collision cell (750). See Eiden [091] fig. 7, col. 15 lines 15-40, col. 17 lines 60-67, and col. 18 lines 1-5. However, Eiden [091] does not specifically state that the mass analyzer be configured to mass analyze the received ion beam at the mass-to-charge ratio. Whitehouse [6,753,523] teaches that multiple line segments of multiple ion guides/multipoles being operated independently of one another. In addition, it teaches that it multiple ion guides/multipoles being used in m/z (m=mass, z=charge) selection in order to narrow the range of m/z values entering the TOF pulsing region in order to obtain a spectrum of only those ions of interest. Also see Whitehouse [6,753,523] abstract, **figs. 1-7,10-17,20**, col. 7 lines 35-67, column 8, col. 9 lines 5-10,50-60, col. 10 lines 20-40,55-60, col. 11 lines 1-6,35-45,60-57, col. 14 lines 15-25,30-45, col. 15 lines 30-35,45-65, **col. 16, lines 1-20,30-67,** col. 17, lines 30-45,60-67, col. 18 lines 10-25, col. 19 lines 50-68, col. 20 lines 5-42, **col. 21 lines 44-67, col. 22 lines 1-20, 35-60, col. 23 lines 3-10, 25-67,** col. 24 lines 5-10,20-40, column 25, **col. 26 lines 5-40,** col. 27 line 65 – col. 28 line 25, 40-45, **col. 38 line 60 – column 40,** col. 44 lines 5-25. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the mass analyzer be configured to mass analyze the received ion beam at the mass-to-charge ratio in order to narrow the range of m/z

values entering the TOF pulsing region in order to obtain a spectrum of only those ions of interest as taught by Whitehouse [6,753,523].

Claims 37-43,57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eiden [091] in view of Whitehouse [6,753,523] and further in view of Mordchai [5,818,041]. As per claims 37, Eiden [091] in view of Whitehouse [6,753,523] teach all aspects of the claim except for explicitly stating that the ion beam being deflected off the axis upstream of the mass-to-charge analyzer. Mordchai [5,818,041] does teach the ion beam being deflected off the axis upstream of the mass-to-charge analyzer. See Mordchai [5,818,041] figs. 1,6,9a-9b, col. 2 lines 54-65, col. 3 lines 35-40. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the ion beam be deflected off the axis upstream of the mass-to-charge analyzer in order aid in separating the ions out from the large gas droplets and solid particles thereby reducing the chance of artifact ions being detected in the measurement as taught in Mordchai [5,818,041].

As per claims 38-39,57, Mordchai [5,818,041] teaches the ion beam including a portion in which ions are transmitted along an axis, and the ion beam is deflected off the axis upstream of the mass-to-charge analyzer. It also teaches a deflector (11) deflecting the ion beam off the axis upstream of the mass-to-charge analyzer. Mordchai [5,818,041] figs. 1,6,9a-9b.

As per claim 40, Eiden [091] in view of Whitehouse [6,753,523] and further in view of Mordchai [5,818,041] teach all aspects of the claim except for explicitly stating that the deflector comprise a double deflector. It would have been obvious to a person

of ordinary skill in the art at the time the invention was made to have the deflector be comprised of a double deflector in order to aid in separating neutral from the ions of interest in two degrees of freedom.

As per claims 41,58 Mordchai [5,818,041] teaches that it was known to use an electrostatic lens/electrostatic sector. See Mordchai [5,818,041] col. 2 lines 50-55.

As per claims 42,59, Eiden [091] in view of Whitehouse [6,753,523] and further in view of Mordchai [5,818,041] teach all aspects of the claim except for explicitly stating the electrostatic sector comprise two cylindrical electrostatic sectors in series. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the electrostatic sector comprise two cylindrical electrostatic sectors in series, since it has been held to be within the general skill of a worker in the art to select a known shape on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claims 43,60 Eiden [091] in view of Whitehouse [6,753,523] and further in view of Mordchai [5,818,041] teach all aspects of the claim except for explicitly stating that the ion beam be deflected off the axis downstream of the collision cell. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the ion beam be deflected off the axis downstream of the collision cell in order to aid in preventing unwanted daughter ions from entering the mass analyzer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,512,226 to Loboda et al, is considered pertinent due to its discussion on a method and apparatus for selective collision-induced dissociation of ions in a quadrupole ion guide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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